

CLAIMS

What is claimed is:

1. An apparatus comprising:

a plurality of transmission circuits to transmit data over one or more of a set of output lines;

a plurality of receiving circuits to receive data over one or more of a set of input lines; and

a plurality of parallel-serial conversion circuits coupled to the plurality of transmission circuits and to the plurality of receiving circuits, the plurality of conversion circuits to convert parallel signals to one or more sets of serial signals and to send the converted serial signals to one or more corresponding transmission circuits, and to receive one or more sets of serial signals from one or more of the receiving circuits and to convert the serial signals to parallel signals.

2. The apparatus of claim 1 further comprising a control circuit coupled to the plurality of transmission circuits, to the plurality of receiving circuits and to the plurality of parallel-serial conversion circuits, the control circuit to control conversion of signals between parallel and serial formats and to control transmission and receiving of data.

3. The apparatus of claim 1, wherein one of the plurality of parallel-serial conversion circuits receives SONET framed data at a first data rate as a parallel signal and converts the parallel signal to a corresponding serial signal at the first data rate.

1 4. The apparatus of claim 3, wherein one of the plurality of transmission
2 circuits transmits the converted serial signal at the first data rate.

1 5. The apparatus of claim 1, wherein one of the plurality of parallel-serial
2 conversion circuits receives SONET framed data at a first data rate as a parallel signal
3 and converts the parallel signals to multiple serial signals at a second data rate, where the
4 first data rate is greater than the second data rate.

1 6. The apparatus of claim 5, wherein one of the transmission circuits
2 transmits the multiple serial signals at the second data rate.

1 7. The apparatus of claim 1, wherein one of the plurality of parallel-serial
2 conversion circuits receives a serial signal at a first data rate and converts the serial signal
3 to a parallel SONET framed data at the first data rate.

1 8. The apparatus of claim 7, wherein one of the plurality of receiving circuits
2 receives the serial signal at the first data rate and sends the serial signal to the parallel-
3 serial conversion circuit.

1 9. The apparatus of claim 1, wherein one of the plurality of parallel-serial
2 conversion circuits receives multiple serial signals at a first data rate and converts the

3 serial signals to parallel SONET framed data at a second data rate, where the second data
4 rate is greater than the first data rate.

1 10. The apparatus of claim 9, wherein one of the receive circuits receives the
2 multiple serial signals at the first data rate.

1 11. A method comprising:
2 receiving a parallel signal at a first rate;
3 converting the parallel signal multiple serial signals; and
4 transmitting the multiple serial signals at a second rate.

1 12. The method of claim 11, wherein the parallel signal is SONET framed
2 data.

1 13. The method of claim 11 further comprising adding stuffing data to one or
2 more of the serial signals such that a sum of a number of multiple signals at the second
3 rate times the second rate is equal to the first rate.

1 14. The method of claim 11 further comprising transmitting the multiple serial
2 signals at the second rate with a first transmitting circuit and with a second transmitting
3 circuit.

1 15. A method comprising:

2 receiving multiple serial signals at a first rate;
3 converting the multiple serial signals to a parallel signal;
4 transmitting the parallel signal at a second rate, wherein the second rate is greater
5 than the first rate.

1 16. The method of claim 15, wherein the parallel signal is SONET framed
2 data.

1 17. The method of claim 15, further comprising removing stuffing data from
2 one or more of the serial signals such that a sum of a number of multiple signals at the
3 first rate times the first rate is equal to the second rate.

1 18. The method of claim 15 further comprising receiving the multiple serial
2 signals at the first rate with a first receiving circuit and with a second receiving circuit.

1 19. An apparatus comprising:
2 means for receiving a parallel signal at a first rate;
3 means for converting the parallel signal multiple serial signals; and
4 means for transmitting the multiple serial signals at a second rate.

1 20. The apparatus of claim 19, wherein the parallel signal is SONET framed
2 data.

1 21. The apparatus of claim 19 further comprising means for adding stuffing
2 data to one or more of the serial signals such that a sum of a number of multiple signals at
3 the second rate times the second rate is equal to the first rate.

SUM A' 1 22. The method of claim 19 further comprising means for transmitting the
2 multiple serial signals at the second rate with a first transmitting circuit and with a second
3 transmitting circuit.

09660837 091400 1 23. An apparatus comprising:
2 means for receiving multiple serial signals at a first rate;
3 means for converting the multiple serial signals to a parallel signal;
4 means for transmitting the parallel signal at a second rate, wherein the second rate
5 is greater than the first rate.

1 24. The apparatus of claim 23, wherein the parallel signal is SONET framed
2 data.

1 25. The apparatus of claim 23 further comprising means for removing
2 stuffing data from one or more of the serial signals such that a sum of a number of
3 multiple signals at the first rate times the first rate is equal to the second rate.

SUB A' 1 26. The apparatus of claim 23 further comprising receiving the multiple serial
2 signals at the first rate with a first receiving circuit and with a second receiving circuit.